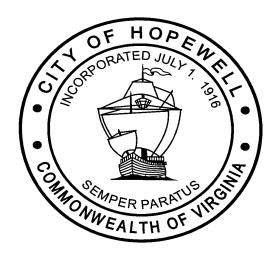
City of Hopewell



Geodetic Survey Marker Reference and Recovery Guide March 2002



Draper Associates established a Survey Control Network for the City of Hopewell in March 2002. Twenty permanent stations and one temporary station were created as part of this project.

Station Monument Descriptions

The permanent stations consist of a 4" domed brass disk set in an 8" diameter concrete cylinder. The cylinders are cast in place, 36" deep, generally set flush with the ground and contain rebar to aid in detection and recovery with the use of magnetic locators. The disks are stamped with the station number. No azimuth stations were set.

Station Data

All data was derived from GPS observations. The final network was adjusted using a constrained least squares adjustment. Coordinates are provided in Geodetic, Meters and U.S. Survey feet. Elevations are provided in Meters and U.S. Survey feet. Horizontal and vertical loop closure errors met the Federal Geodetic Control Committee standard for a First Order GPS survey. Location Sketches are provided for each station and are not drawn to scale. Also included are pictures showing station occupation and partial existing conditions.

<u>Datum</u>

The horizontal datum is Virginia Coordinate System of 1983 – South Zone (1993 adjustment). The vertical datum is North American Vertical Datum of 1988 (NAVD88).

Metadata

Included for each station are the Convergence Angle and Scale Factor. Elevation and Combined Scale factors are not included.

Equipment

All observations were conducted with Ashtech Z-Surveyor FX dual frequency receivers, Ashtech dual frequency antennae and 2-meter fixed-height tripods.

Station Location

City of Hopewell personnel sited all station locations.

CITY OF HOPEWELL GEODETIC SURVEY MARKER OVERVIEW MAP





GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 1

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Cedar Lane and E. Broadway Street, proceed north 0.3 mile to the 600 block of Cedar Lane. Monument is on left abutting the curb.

Location

Latitude: N 37°18'51.9358" Longitude: W 77°16'37.2112"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 3,640,342.50
 N: 1,109,578.613

 11,838,566.22
 E: 3,608,402.200

NAVD 88 Feet NAVD 88 Meters

Elev: 41.3 Elev: 12.59

Metadata

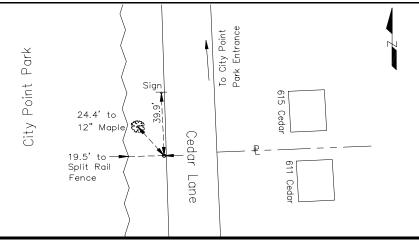
Convergence: 0°44'32.16" Scale Factor: 0.999945828

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 2 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

Station is located in the northeast quadrant of the intersection of W. Broadway Street and Prince George Avenue.

Location

Latitude: N 37°18'08.1312" Longitude: W 77°18'38.4559"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.635.787.39 1.108.190.214 11,828,828.62 3,605,434.175

NAVD 88 Meters NAVD 88 Feet

Elev: 61.4 Elev: 18.72

Metadata

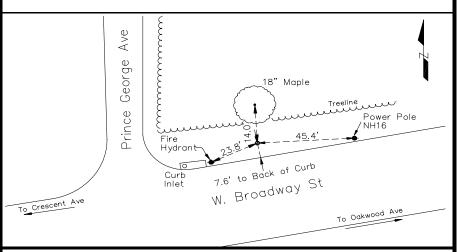
Convergence: 0°43'18.58" Scale Factor: 0.999946046

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 3 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

Station is located on the right, off of Randolph Road (Rt 10 eastbound) and Riverside Loop Road, 300 feet from the end of the bridge over the Appomattox River.

Location

Latitude: N 37°18'33.5736" Longitude: W 77°17'44.7044"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.638.415.45 N: 1.108.991.246 E: 11,833,138.22 3,606,747.744

NAVD 88 Feet NAVD 88 Meters

Elev: 36.8 Elev: 11.22

Metadata

Convergence: 0°43'51.20" Scale Factor: 0.999945914

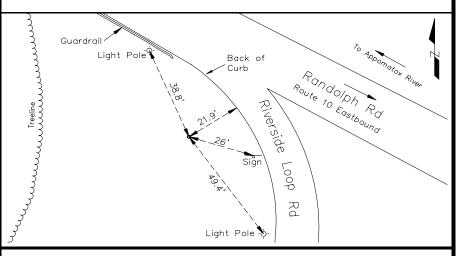
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 4 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of River (Rt 645) and Atwater Roads, proceed north 0.8 mile to the 700 block of Atwater Road. Station is on the right in grass.

Location

Latitude: N 37°18'26.7719" Longitude: W 77°19'48.2046"

Virginia State Plane Grid-South Zone

NAD 83 (93) **US Survey Feet**

3.637.602.12 1.108.743.344 N: 11,823,170.45 3,603,709.561

NAVD 88 Feet NAVD 88 Meters

Elev: 75.3 Elev: 22.95

Metadata

Convergence: 0°42'36.25" Scale Factor: 0.999945948

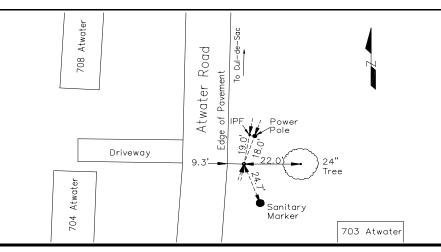
Date: March 2002



Meters

Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 5

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of River (Rt 645) and Atwater Roads, proceed north 0.2 mile to Beacon Ridge Drive. Turn right on Beacon Ridge and proceed to T intersection with Anchor Point Boulevard. Station is directly ahead in grass.

Location

Latitude: N 37°18'19.8377" Longitude: W 77°19'33.2830"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 3,636,915.83
 N: 1,108,534.161

 11,824,384.57
 E: 3,604,079.625

NAVD 88 Feet NAVD 88 Meters

Elev: 46.5 Elev: 14.17

Metadata

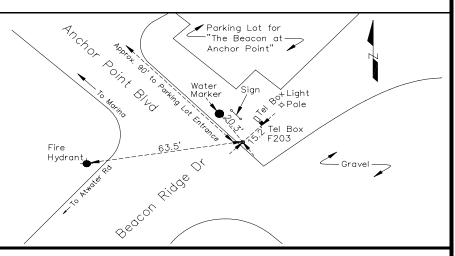
Convergence: 0°42'45.30" Scale Factor: 0.999945984

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 6 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Randolph Road (Rt 10) and Industrial Street, proceed northeast on Industrial Street 0.7 mile to entrance of Smurfit Stone. Station is on the right in grass before gated entrance to parking lot.

Location

Latitude: N 37°18'16.7542" Longitude: W 77°16'06.1410"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.636.817.22 N: 1.108.504.105 E: 11,841,122.29 3,609,181.294

NAVD 88 Meters NAVD 88 Feet Elev: 44.5 Elev: 13.57

Metadata

Convergence: 0°44'51.02" Scale Factor: 0.999946000

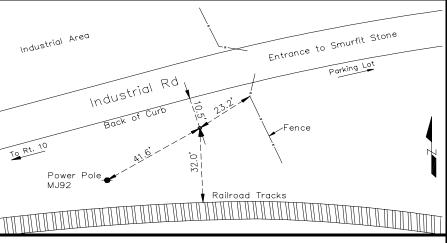
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 7

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 20' beyond marker, along the fence.

Station is located in the northwest quadrant of the intersection of River and Atwater Roads, in a field.

Location

Latitude: N 37°17'55.9860" Longitude: W 77°19'50.5336"

Virginia State Plane Grid-South Zone

NAD 83 (93) US Survey Feet

 US Survey Feet
 Meters

 N: 3,634,486.39
 N: 1,107,793.668

 E: 11,823,020.88
 E: 3,603,663.970

NAVD 88 Feet NAVD 88 Meters

Elev: 79.1 Elev: 24.11

Metadata

Convergence: 0°42'34.83" Scale Factor: 0.999946115

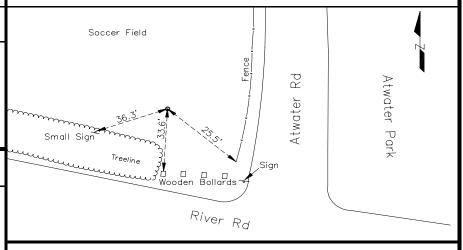
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station #8 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

Station is located in the southeastern corner of the intersection of 21st and Jackson Streets, behind the sidewalk.

Location

N 37°17'48.1004" Latitude: Longitude: W 77°18'13.9337"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.633.786.71 1.107.580.403 N: E: 11,830,835.37 3,606,045.832

NAVD 88 Feet NAVD 88 Meters

Elev: 60.0 Elev: 18.30

Metadata

Convergence: 0°43'33.46" Scale Factor: 0.999946161

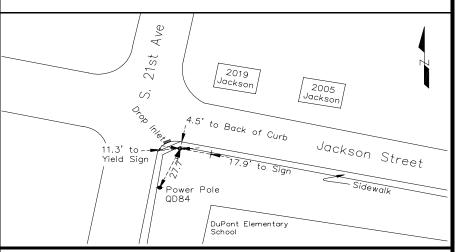
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 9

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Randolph Road (Rt 10) and Winston Churchill Drive (Rt 156), proceed southwest 0.2 mile on Winston Churchill Drive. Station is located in island on left.

Location

Latitude: N 37°17'41.6896" Longitude: W 77°16'46.7715"

Virginia State Plane Grid-South Zone

NAD 83 (93) US Survey Feet

N: 3,633,228.52 N: 1,107,410.266 E: 11,837,885.84 E: 3,608,194.820

NAVD 88 Feet NAVD 88 Meters

Elev: 46.1 Elev: 14.06

Metadata

Convergence: 0°44'26.36" Scale Factor: 0.999946200

Date: March 2002

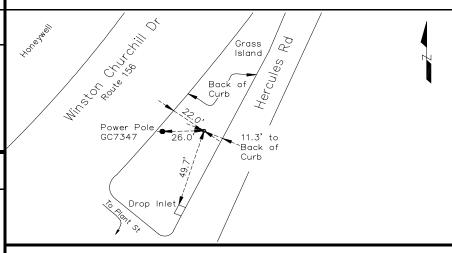


Meters

Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE DATA

Description Station # 10

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection Randolph (Rt 10) and Hummel Ross Roads, proceed northeast along Hummel Ross Road to its intersection with Hummel Ross Court. Proceed east to the end of Hummel Ross Court, into HRWTF. Bear right into parking lot. Station is past Administration Building, on the right, in grass.

Location

Latitude: N 37°17'41.6656" Longitude: W 77°15'32.3943"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 N: 3,633,304.43
 N: 1,107,433.405

 E: 11,843,895.14
 E: 3,610,026.459

NAVD 88 Feet NAVD 88 Meters

Elev: 35.5 Elev: 10.83

Metadata

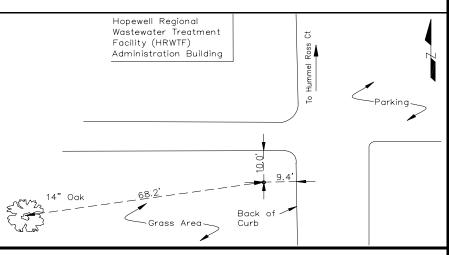
Convergence: 0°45'11.50" Scale Factor: 0.999946200

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 11

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Jackson Farm and Cedar Level Roads, proceed west on Jackson Farm Road 0.5 mile to its intersection with Pin Oak Drive. The station is on the northwestern corner abutting the curb.

Location

Latitude: N 37°17'13.6155" Longitude: W 77°19'36.5280"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 N: 3,630,215.48
 N: 1,106,491.893

 E: 11,824,205.66
 E: 3,604,025.092

NAVD 88 Feet NAVD 88 Meters

Elev: 69.3 Elev: 21.12

Metadata

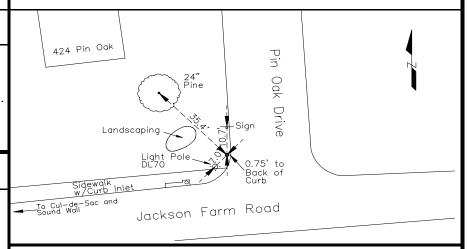
Convergence: 0°42'43.33" Scale Factor: 0.999946380

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 12

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Jackson Farm Road and Mesa Drive, follow Jackson Farm Road east until it turns into Oak Lane. Proceed on Oak Lane until its intersection with Sherman Avenue. Turn right and follow Sherman Avenue southeast one block to Bogese Lane. Station is on right in grass.

Location

Latitude: N 37°17'17.0066" Longitude: W 77°18'30.0583"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 I: 3,630,625.71
 N: 1,106,616.930

 I: 11,829,572.31
 E: 3,605,660.851

NAVD 88 Feet NAVD 88 Meters

Elev: 57.2 Elev: 17.44

Metadata

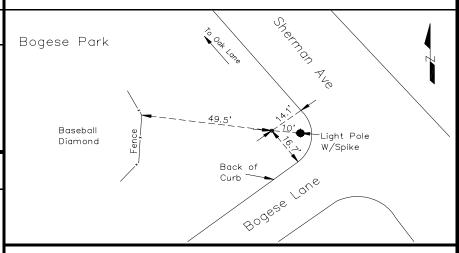
Convergence: 0°43'23.67" Scale Factor: 0.999946358

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 13

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Arlington Road (Rt 156) and Wakefield Street, follow Wakefield Street northeast to its terminus at New York Avenue. Turn left and follow New York Avenue northwest one block and turn right on Waverly Street. Station is in park on the right.

Location

Latitude: N 37°17'01.4221" Longitude: W 77°17'15.7111"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 N: 3,629,126.14
 N: 1,106,159.860

 E: 11,835,599.97
 E: 3,607,498.085

NAVD 88 Feet NAVD 88 Meters

Elev: 39.5 Elev: 12.05

Metadata

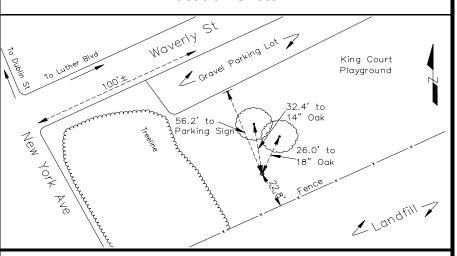
Convergence: 0°44'08.80" Scale Factor: 0.999946465

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 14

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

Station is set behind City of Hopewell welcome sign on Randolph Road (Rt 10) westbound from Prince George County and bridge over Bailey Creek.

Location

Latitude: N 37°17'23.8167" Longitude: W 77°15'39.9656"

Virginia State Plane Grid-South Zone

NAD 83 (93)

 US Survey Feet
 Meters

 N: 3,631,491.35
 N: 1,106,880.776

 E: 11,843,307.11
 E: 3,609,847.226

NAVD 88 Feet NAVD 88 Meters

Elev: 15.0 Elev: 4.57

Metadata

Convergence: 0°45'06.91" Scale Factor: 0.999946313

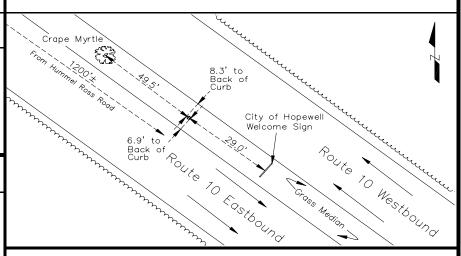
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 15

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Cedar Level Road and Kippax Drive, follow Kippax Drive west 0.4 mile to its intersection with Collindale Road. Turn right and follow Collindale Road north 300 ft to its intersection with Collindale Court. Station is in the northeast quadrant of the intersection.

Location

Latitude: N 37°16'31.7759" Longitude: W 77°19'32.0926"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 3,625,988.70
 N: 1,105,203.565

 11,824,616.69
 E: 3,604,150.377

NAVD 88 Feet NAVD 88 Meters

Elev: 73.5 Elev: 22.41

Metadata

Convergence: 0°42'46.02" Scale Factor: 0.999946684

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch

706 Collindale

706 Collindale

705 Collindale

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708 Collindale

709 Collindale

709 Collindale







GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 16 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Wilmington Avenue and Oaklawn Boulevard, follow Wilmington Avenue southeast one block to circle encompassing Fire Station #2. Station is on the eastern side of the circle in the grass.

Location

Latitude: N 37°16'36.3206" Longitude: W 77°18'30.8768"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.626.510.30 N: 1.105.362.550 11,829,558.10 3,605,656.520

NAVD 88 Meters NAVD 88 Feet

Elev: 82.6 Elev: 25.17

Metadata

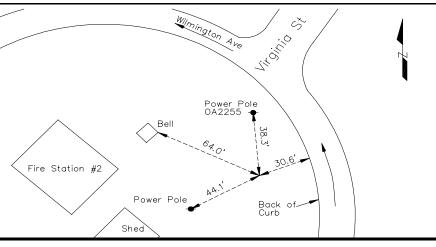
Convergence: 0°43'23.18" Scale Factor: 0.999946649

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Description Station # 17

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Arlington Road (Rt 156) and Locust Street, follow Locust Street northeast to Dellrose Drive. Turn right on Dellrose Drive and proceed 0.1 mile to Cloverdale Avenue. Turn left on Cloverdale Avenue and follow into landfill. Station will be 0.2 mile on right in grass by transmission tower.

Location

Latitude: N 37°16'44.6008" Longitude: W 77°16'56.9020"

> Virginia State Plane Grid-South Zone NAD 83 (93)

 US Survey Feet
 Meters

 3,627,444.57
 N: 1,105,647.316

 11,837,141.81
 E: 3,607,968.040

NAVD 88 Feet NAVD 88 Meters

Elev: 35.2 Elev: 10.73

Metadata

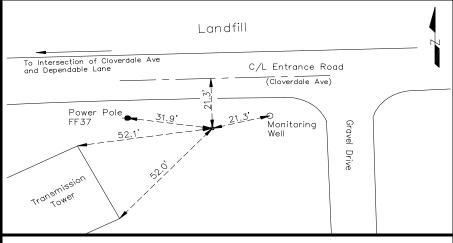
Convergence: 0°44'20.21" Scale Factor: 0.999946587

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 18 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located 2' beyond.

To reach station from the intersection of Cedar Level Road and Oaklawn Boulevard (Rt 36), follow Oaklawn Boulevard west 0.4 mile. Station is on right in open grassy area between I-295N on-ramp and overpass.

Location

Latitude: N 37°16'05.4979" Longitude: W 77°19'16.5612"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.623.346.84 1.104.398.327 11,825,905.06 3,604,543.072

NAVD 88 Meters NAVD 88 Feet

Elev: 82.7 Elev: 25.20

Metadata

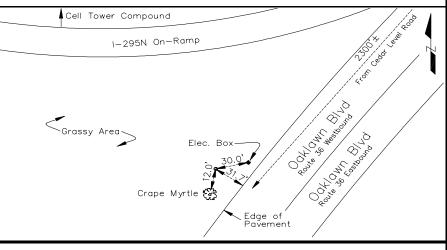
Convergence: 0°42'55.45" Scale Factor: 0.999946896

Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 19 Description

Station is a 4" bronze disk set in an 8" concrete monument.

To reach station from the intersection of Oaklawn Boulevard and Dinwiddie Avenue. follow Dinwiddie Avenue southeast 0.6 miles to T intersection with Spring Road. Turn left and follow Spring Road northeast to end of cul-de-sac. Station is set in pavement in the approximate centerline of Spring Road.

Location

Latitude: N 37°15'57.6156" Longitude: W 77°18'13.9098"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.622.613.41 1.104.174.774 N: E: 11,830,978.88 3,606,089.575

NAVD 88 Meters NAVD 88 Feet

Elev: 67.5 Elev: 20.56

Metadata

Convergence: 0°43'33.48" Scale Factor: 0.999946962

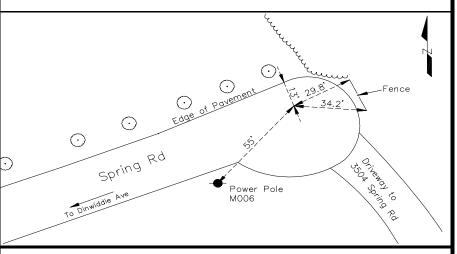
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station # 20 Description

Station is a 4" bronze disk set in an 8" concrete monument with witness post located at the monument.

To reach station from the intersection of Crossing and Oaklawn Boulevards, follow Oaklawn Boulevard west 0.1 mile. Station is in center median.

Location

Latitude: N 37°15'31.0588" Longitude: W 77°19'45.5246"

> Virginia State Plane Grid-South Zone NAD 83 (93)

US Survey Feet Meters 3.619.834.89 1.103.327.880 11,823,607.32 3,603,842.720

NAVD 88 Meters NAVD 88 Feet

Elev: 79 1 Elev: 24.11

Metadata

Convergence: 0°42'37.87" Scale Factor: 0.999947197

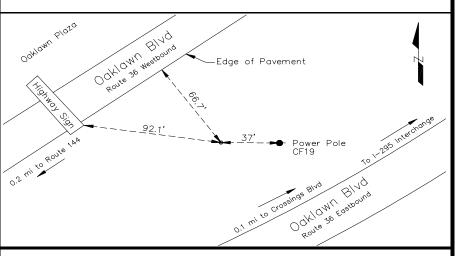
Date: March 2002



Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch









GEODETIC SURVEY MARKER REFERENCE AND RECOVERY DATA

Station #21 Description

Station is a PK nail set in the edge of pavement.

Station is located on the right of I-295 southbound at the south end of bridge over Appomattox River at Mile Marker 13.

Location

Latitude: N 37°18'36.6816" Longitude: W 77°20'12.6118"

Virginia State Plane Grid-South Zone

NAD 83 (93) **US Survey Feet**

3.638.579.94 N: 1.109.041.383 E: 11,821,186.45 3,603,104.837

NAVD 88 Meters NAVD 88 Feet

Elev: 59.5 Elev: 18.14

Metadata

Convergence: 0°42'21.43" Scale Factor: 0.999945899

Date: March 2002



Meters

Horizontal & vertical data derived from GPS observations to support 2002 aerial

photography.

Location Sketch

